Also inside: Patents Don't Equal Innovation 24 | Detroit Plans To Seek Its Own High-Tech Visa 6

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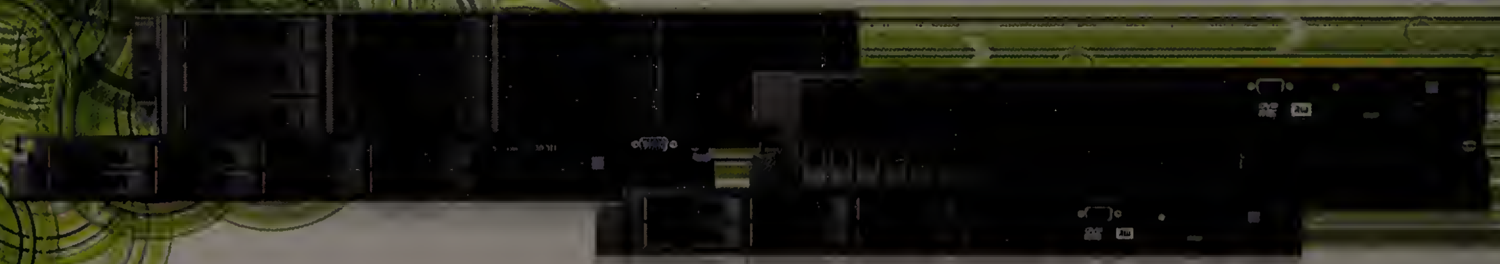

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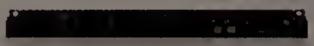

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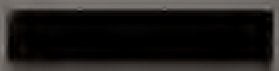

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[1] As of May 7, 2013. See http://www.tpc.org/1791

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THIS ISSUE | 02.10.2014 [VOL. 48, NO. 2 $5/COPY]

17
MALWARE: WAR WITHOUT END?

COVER STORY

Think Strategically, Speak Strategically

12 As an IT pro, you know you need to think strategically – but can you speak strategically, too? CIOs share advice on how to catch the ear of senior management.

Malware: War Without End?

17 After decades of fighting off cyberattacks and malware such as viruses, worms and Trojans, victory in the war on cybercrime remains beyond reach, and possibly irrelevant.

Courting Customers With Mobile Apps

20 Mobile presents an opportunity for companies to tighten customer relationships, but it also poses development challenges for IT. Here are three companies that are succeeding with mobile.

HEADS UP | **2** Why Google thinks **thermostats** are hot. | Amazon was the **No. 1 job poster** in 2013. | **4** A slow-but-steady **Google Apps** rollout is underway in Maryland. | A new graphene-like **3D material** may revolutionize storage.

NEWS ANALYSIS
6 Detroit wants a **high-tech visa** of its own. | **7** Hardware is **Microsoft's albatross.**

OPINIONS | **24 Preston Gralla** says patent wars threaten true innovation. | **32 Thornton May** charts the path that companies follow to big data mastery.

DEPARTMENTS
8 The Grill: Healthcare CIO Darren Ghanayem | **23 Security Manager's Journal:** Endpoint DLP will fill gaps in network DLP. | **26 Career Watch** | **30 Shark Tank**

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The Nest Learning Thermostat is designed to remember users' schedules and the temperature settings they prefer to create custom heating and cooling schedules for homes.

PHOTO COURTESY OF NEST

INTERNET OF THINGS

Why Google Wants to Sell Thermostats

GOOGLE IS MOVING into your home with its $3.2 billion acquisition of Nest Labs, a maker of smart smoke alarms and thermostats. The deal gives Google a foothold in a hot new niche of the Internet of Things market known as the connected home.

The idea is to link heating systems, lighting and appliances to the Internet, so they can be made more efficient and be controlled from afar. But such setups enable companies to collect more and more data about people's habits, something Google has been doing for a while.

Shortly after the announcement, Nest co-founder Matt Rogers addressed the privacy concerns raised by this kind of technology. The company's policy limits the use of customer information to "providing and improving Nest's products and services," he wrote in his corporate blog. "We've always taken privacy seriously and this will not change."

The all-cash deal is proof that Google is serious about the Internet of Things. If the sale is approved, it will be one of Google's largest acquisitions since it bought YouTube for $1.6 billion in 2006.

Nest makes a thermostat and a smoke-and-carbon-monoxide monitor that can be controlled via Wi-Fi from a smartphone; all of its devices can reprogram themselves based on people's behavior.

"This is a new area for Google, representing a desire to take advantage of all devices," said Ben Bajarin, an analyst at research firm Creative Strategies. "Google wants its own platform for this world of connected things."

– Zach Miners, IDG News Service

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IT CAREERS

Amazon Tops List of IT Job Posters for 2013

Amazon.com was the employer with the most IT job postings last year. Its 16,146 ads exceeded the totals of most other IT companies by a wide margin, according to a new report.

The top runners-up were Accenture, at 14,240, and Deloitte, at 13,077 help-wanted ads, according to CompTIA's annual IT Industry Outlook report.

Accenture, recently hired by the U.S. government to be the new lead contractor for the troubled Healthcare.gov website, and Deloitte are IT services providers. Best known as an online retailer, Amazon recently won a contract to develop a cloud computing system for the CIA.

CompTIA based the report on data from Burning Glass Technologies in Boston, which analyzes online job postings from approximately 32,000 jobs sites.

Microsoft had the fourth-most IT job postings at 12,435, followed by Best Buy, with 10,725.

Burning Glass CEO Matthew Sigelman said Best Buy's hiring in part represents the growing importance of "middle skill" IT jobs – those that don't necessarily require a bachelor's degree. Last year, Burning Glass said, about 200,000 IT job ads did not require a bachelor's degree.

CompTIA warns that not all postings lead to job offers, since companies may hire internally, outsource the work or withdraw postings.

– PATRICK THIBODEAU

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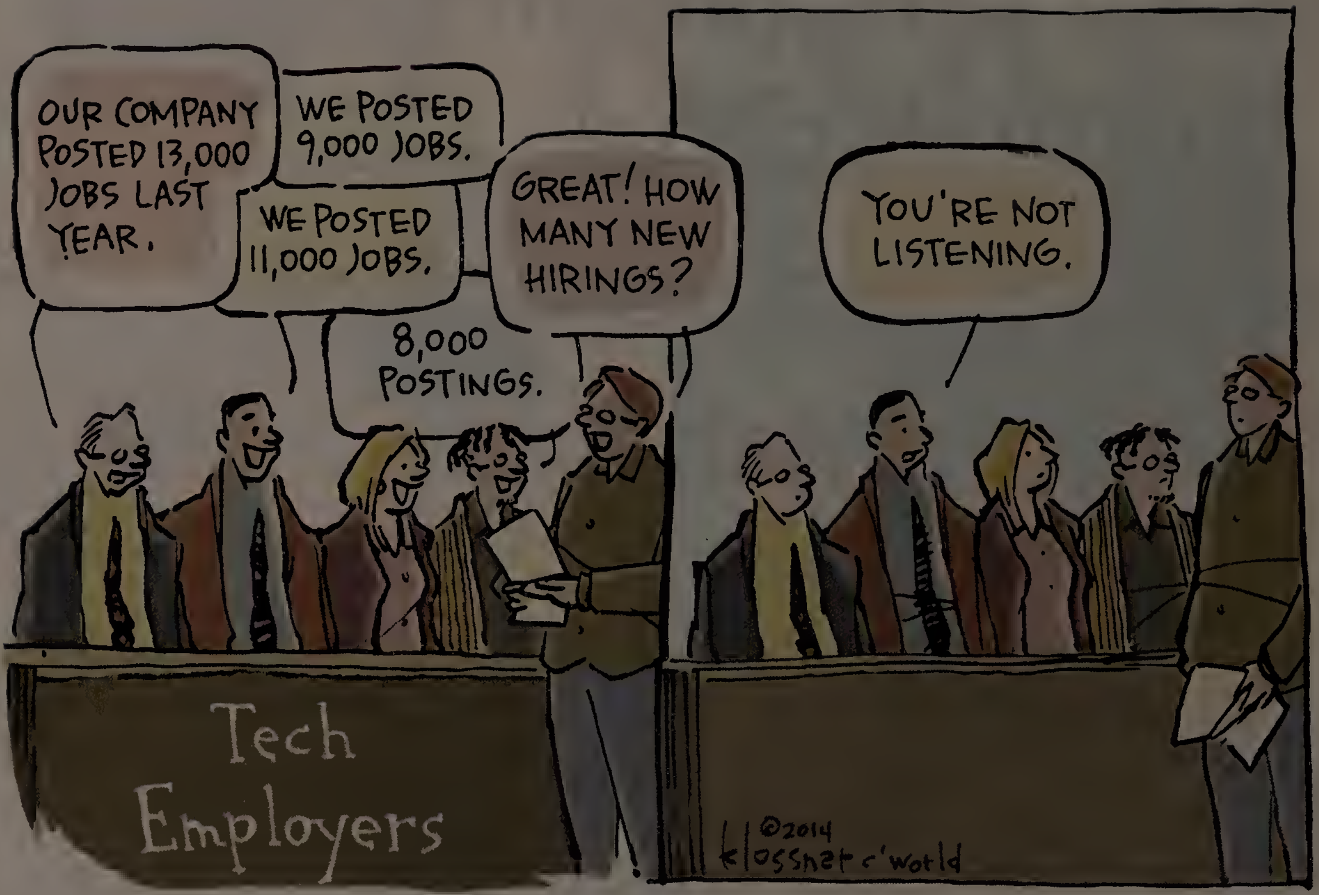
BETWEEN THE LINES

By John Klossner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CLOUD COMPUTING

Maryland Slowly Rolls Out Google Apps

TAKING A "be quick but don't hurry" approach, the state of Maryland is in the midst of a three-and-a-half-year migration to Google Apps, reckoning that a measured, deliberate rollout is better than a big-bang implementation.

The state chose Google Apps in 2011, after deciding it wanted a cloud email and collaboration suite to replace a variety of on-premises and heterogeneous email systems across more than 50 agencies.

It has thus far moved about 33,000 employees to Google Apps, with around 21,000 more to go, as it gradually turns off internal servers running Novell's GroupWise, Microsoft's Exchange and other systems from other vendors. The rollout started in January 2012 and is expected to conclude in June 2015.

"We're over the halfway hump, and we have a lot of momentum," said Greg Urban, CTO and deputy CIO of the Maryland state government.

The state has mostly handled the transition with internal IT staff, with some outside help.

Urban cited several reasons for taking a measured approach. First, the Apps rollout is being done in parallel with a directory implementation to centralize user management across all agencies. In addition, he wants to make sure his staff is familiar with the technical aspects of the new setup.

"My organization has to support this for as long as we have it," he said.

He also estimates that by handling the bulk of the work internally, the state is spending significantly less money than it would have if it had hired a battalion of systems integrators to do an accelerated rollout.

Urban said the main thrust behind moving all employees to Google Apps was to put the entire staff on a modern email platform that is secure and scalable, while also giving workers access to collaboration tools, including the Docs productivity apps, the Drive cloud storage service and the Sites intranet tool.

– Juan Carlos Perez, IDG News Service

Micro Burst

Google is offering

$2.7 million

to researchers who can hack into its Chrome OS.

EMERGING TECH

Graphene-like 3D Material May Advance Storage

Researchers have discovered a material with a similar electronic structure to graphene that can exist in three dimensions and could lead to faster transistors and more compact, higher-capacity hard drives.

The material, a form of the chemical compound sodium bismuthate, is called three-dimensional topological Dirac semimetal (3DTDS).

A team led by scientists from Oxford University, Diamond Light Source, Rutherford Appleton Laboratory, Stanford University and Lawrence Berkeley National Laboratory's Advanced Light Source discovered 3DTDS. Their research paper on the subject was recently published in the journal *Science*.

Researchers said the material could be used to, for example, turn a 1TB hard drive "into a drive that can store 10 terabytes within the same volume."

Unlike graphene, 3DTDS allows electrons to be assembled in a collective to flow in all directions. More important, the electrons on the surface of the material remember their magnetic spin, so data can be stored by reversing the polarity of a bit.

Scientists have long searched for a natural 3D material with the same properties as graphene. They now know that such a material exists.

– LUCAS MEARIAN

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Michigan Gov. Rick Snyder proposes giving EB-2 visas to immigrants who hold advanced degrees or have "exceptional ability" and agree to live and work in Detroit.

Detroit to Seek Its Own High-Tech Visa

Gov. Snyder's proposal that 50,000 green cards be assigned to a city in bankruptcy faces a tough sell in Washington. By Patrick Thibodeau

DETROIT, A BANKRUPT CITY dealing with a shrinking population, hopes that 50,000 employment-based green cards can help turn things around.

Michigan Gov. Rick Snyder last month pitched the idea of offering EB-2 visas to immigrants with advanced degrees or with "exceptional ability" in the sciences, arts and business. The visa holders would have to agree to "live and work" in Detroit for an as-yet undetermined length of time.

Snyder's plan hasn't been tried anywhere else in the country, so convincing the White House, let alone Congress, that an immigration carve-out for Detroit is needed would likely be a very tough sell.

At this point, Snyder is seeking only to reallocate existing green cards, not increase the number of employment-based visas issued, so only White House action is required. Raising the cap would also require approval by Congress.

U.S. law allows for 140,000 green cards to be issued each year. Of those, 40,000 are EB-2 visas, and there's already a multiyear backlog of demand for employment-based green cards, particularly from India and China.

Any reallocation of those numbers to exclusively help Detroit would "adversely affect" others already in line for visas, said Bruce Morrison, a former Democratic congressman from Connecticut who authored a 1990 overhaul of immigration laws.

However, Morrison agreed that "the idea of municipally based employment visas is a good idea." Immigrants can bring in new outlooks, he said, adding, "You do get a different perspective about rebuilding places when you bring in newcomers."

Snyder is initially asking that the U.S. set aside 5,000 of the available EB-2 visas for Detroit in the first year, 10,000 in each of the next three years, and 15,000 in the fifth year.

Detroit Mayor Mike Duggan supports the proposal. "In order for Detroit to grow again, we need highly trained workers to move in, open businesses and raise their families," he said in a statement.

Employment-based visas generally require that an employer certify to the U.S. Department of Labor that it couldn't find a qualified U.S. worker for the job. But Michigan is seeking a "national interest waiver" that allows someone to get an EB-2 visa without such labor certification.

To get a "national interest waiver," an applicant must show that "the national benefits you offer are so great that they outweigh the national interests inherent in the labor certification process," according to the U.S. Citizenship and Immigration Services.

"I'm a little bit uncomfortable with that, given the near 18% unemployment rate in Detroit," said Daniel Costa, an immigration policy analyst at the Economic Policy Institute. "If there's a labor shortage in a place like Detroit, then employers should have to prove it. I'm also not convinced that there are enough unfilled high-tech jobs for this many immigrants to take — with or without labor certification."

Costa said Snyder would have more credibility on the issue if he were doing more to help workers in Detroit.

"I also think the federal government should be offering people in the U.S. some money and land in Detroit if they'll move there," said Costa, or "just offer it to people across the country who have advanced degrees." ◆

> "I'm also not convinced that there are enough **unfilled high-tech jobs** for this many immigrants to take – with or without labor certification.

Despite promoting its devices in retail outlets like this Microsoft store in San Francisco, Microsoft hasn't been able to earn much profit from sales of hardware.

JONATHAN ALCORN / REUTERS

Hardware's a Drag on Microsoft's Profits

Microsoft says new 'services and devices' strategy helped it beat fourth-quarter expectations, but analysts argue that it detracts from a very profitable software business. By Gregg Keizer

FOR ALL HIS TALK of "devices and services," Steve Ballmer will leave his successor as Microsoft CEO an economic powerhouse that prints money by making software but doesn't reap much revenue off of anything else.

The next chief executive will have to turn Ballmer's words into reality or, less likely, pivot the company back toward its lucrative roots.

"Their devices strategy is more aspirational, and the 'devices and services' strategy is in some ways a misnomer. They are still a software company," said Gartner analyst David Mitchell Smith.

The fourth-quarter report Microsoft filed with the U.S. Securities and Exchange Commission makes that clear.

The two Microsoft business units that primarily sell software — Commercial Licensing and Devices and Consumer (D&C) Licensing — generated 66% of the company's fourth-quarter revenue and accounted for 93% of its gross margin.

> "Their devices strategy is more aspirational, and the **'devices and services strategy'** is in some ways a misnomer. They are still a software company.
>
> ANALYST, GARTNER

While sales of the Surface tablet and Xbox game console were largely responsible for Microsoft beating Wall Street's expectations, a closer look reveals high costs and declining margins for the devices — a fact of life that the company must deal with as it pushes a strategic revamp.

For the fourth quarter of 2013, Microsoft reported record revenue of $24.5 billion, up 14.3% from the same period a year earlier, but its profit rose by just 2.8%, to $6.6 billion.

Much of the gap between those figures was attributed to the D&C Hardware unit that's responsible for the Surface and Xbox. The division's margin was about 9%. That's low for premium-priced goods like Xbox and the Surface. It's also low compared to Apple's gross margin, which is in the mid-30s. And it's strikingly low compared to Microsoft's software margins.

"You can't run a super-successful hardware business with gross margins at 10% or lower," said Patrick Moorhead, an analyst at Moor Insights & Strategy. "In a general way, they're using hardware as a loss leader."

Unlike software, which historically generates very high margins, component and distribution costs for hardware not only never vanish but result in much smaller profits, especially at the beginning of a product's life cycle, when a vendor can't capitalize on large-scale orders or leverage high sales volume to squeeze distributors and retailers.

The trick is to reap the sizable revenue that hardware can generate, and also produce significant profits. Among device manufacturers, only Apple has consistently done both.

In a conference call last month, Microsoft CFO Amy Hood dodged a question on what Surface sales volume is needed to produce big profits, and instead repeated a long-held corporate mantra: The tablet is a model for others to follow, not necessarily a business meant to turn a profit.

IDC analyst Rajani Singh sees little chance that Microsoft can be successful in the "highly, highly competitive" hardware market. "Devices are not something that Microsoft can benefit from in either the short or the long run," she said.

Singh said it's foolish for Microsoft to divert energy and resources into new markets unless it makes the entire company more profitable. "The whole should be worth more than the pieces," she said.

Moorhead was blunt: "Financially, Microsoft is doing just fine. But strategically, I can't make a case that they are doing well at all. In mobility, smartphones and tablets — even in the cloud — I'm not impressed." ◆

THE Grill

Darren Ghanayem

To keep pace with the Affordable Care Act, this CIO has turned to agile methodologies.

Family: Wife and a 9-year-old daughter

Downtime activities: Riding motorcycles, hiking, being outdoors

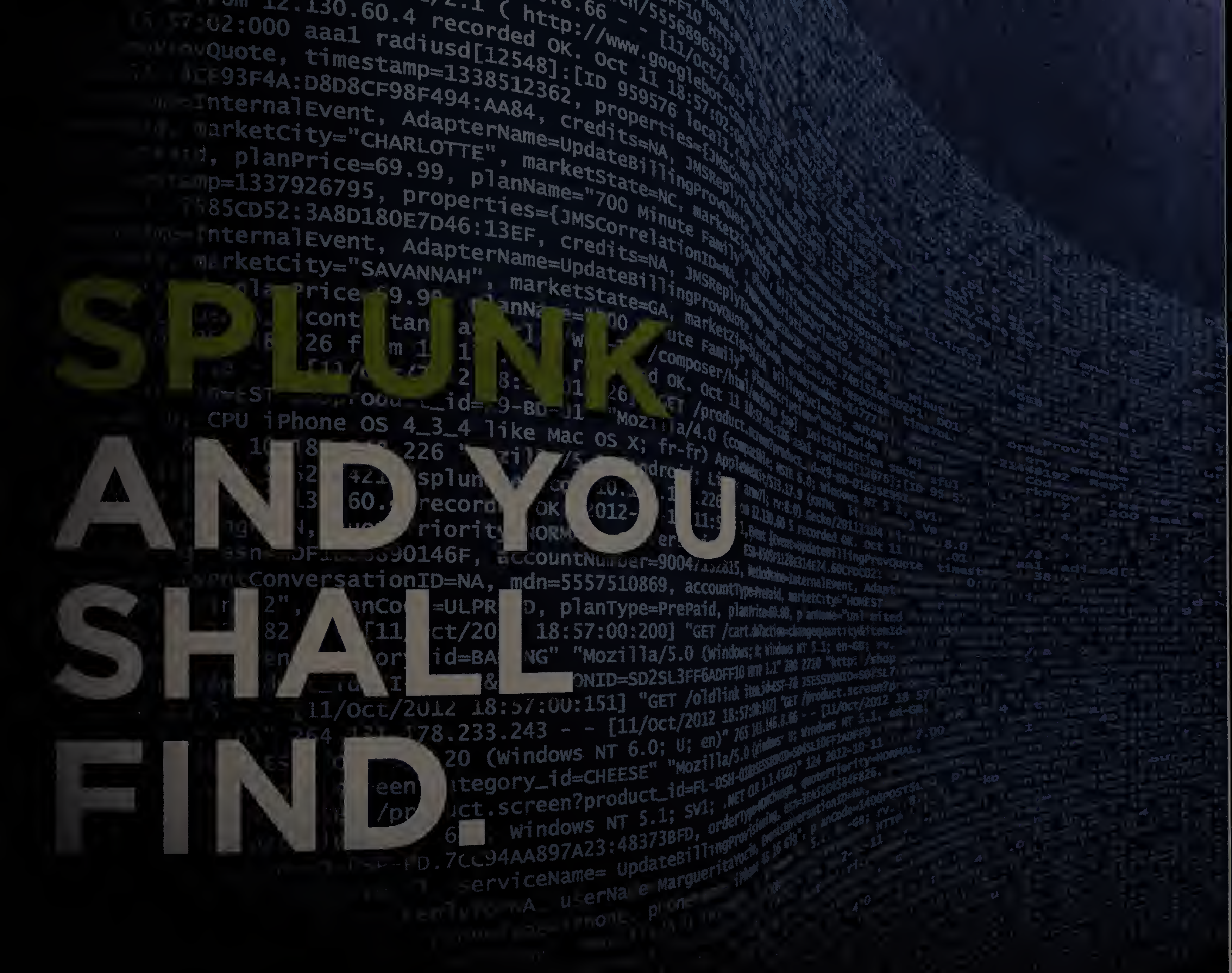
What's on your iPod? "I trade a new playlist on a monthly basis. I have about 16,000 songs. I name my playlists by the month and year. But my favorite artist is Peter Gabriel."

What's on your reading list? "*The First 90 Days* [by Michael Watkins] is my bible at the moment, but what I enjoy are John Grisham books."

Is there something most people don't know about you? "I enjoy watercolor art. I do have an artistic streak. I paint pictures of flowers."

PHOTO COURTESY OF WELLPOINT

INSURANCE COMPANIES *are under intense pressure these days. They're expected to deliver better care at lower costs. They're required to meet the mandates of the new federal healthcare law. And they're expected to continue supporting corporate initiatives. As vice president and CIO in the commercial business unit of health benefits provider WellPoint, Darren Ghanayem says he's keenly aware that technology is key to his company's ability to meet all those demands. "Everything we do from a business perspective has IT down at the core," says Ghanayem, who oversees an IT organization with 2,235 employees and an annual budget of $600 million. Here, he shares his views on what it takes to deliver IT in today's environment.*



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How does technology fit into the changing healthcare landscape? We don't manage or make a tangible asset. We manage information, so we are core to the fabric of everything this company wants to do, whether it's to get into a new market or become compliant with a regulation. There is virtually nothing that our business does that doesn't involve IT.

What's your IT strategy for WellPoint? We've got five sections of our IT strategy. No. 1 is to grow and support our business initiatives, whether they be maximizing our member health or modifying our provider reimbursement. No. 2: to stay compliant with our regulations, whether it's state, federal or local. No. 3 is to innovate with new solutions, new ways to allow [our members] to access healthcare or deliver new technologies to empower consumers to make better choices. No. 4 is to consolidate and simplify our environment. We have grown through acquisition over the years, and as we acquire, our infrastructure becomes more complex. And No. 5 is to stabilize and improve our operational environment to support our business in a global marketplace, in operations that could run a 24-hour shop across the globe.

> "Because the definition of success has changed so frequently through this [healthcare] exchange project, **we had to get more agile, lean and iterative.**

How do you achieve these five strategic points? Our annual budget cycle is not an event, it's a process. We go through months of activities that involve prioritizing. That goes from marketing dynamics — where are we competitive, where are we winning, where are we lagging behind — and we [look at] where we want to go, what we want to become, and so we invest in ourselves.

How do you prioritize IT needs at your company? It's on a return-on-investment model. It requires each one of the ideas we generate to create a business plan. The business plan is actually a preliminary IT deployment strategy, and it has to account for the cost. The costs are in the form of labor, infrastructure or software. And so when you look at the entire investment of resources, then you look at what you're going to return on the back end — lower cost of care, lower cost of business, improved health, which will ultimately have a material impact on our members, and then we look at it not just from a financial perspective but how quickly the return on investment will be achieved.

What's the biggest technical project for your IT team now? The healthcare exchange. It creates marketplaces for our products. We had to conform to the rules and regulations for participating in all 14 marketplaces — [that is] the states we're operating in. And each state has local nuances. The 15th marketplace, if you will, is the federal one. That's a big challenge. The target of success has been very volatile, because it's something that's been developed on the fly.

What's the biggest challenge with this project? We've got a very disciplined process for how we manage IT projects. We go through a step-by-step waterfall. But because the definition of success has changed so frequently through this exchange project, we had to get more agile, lean and iterative.

Your team is consolidating multiple complex methodologies and systems as a result of acquisitions. What were the challenges with that? The problem with having multiple systems is that those systems we've acquired over time were built through years and years of business processes. So the system really mirrors the process.

But we want to have consistency through markets. When we're dealing with systems that were built on processes unique for a market, it really challenges us to say: "Is the system correct or incorrect based on what we want to become?" That's where disagreements occur between the business units, with an IT delivery deadline looming over our head. We have to understand the impact on business and what we want to become versus what we are. A lot of companies that want to consolidate after acquisition run into the same challenge.

Is IT the moderator when there are disagreements? That's the role we play, because we've learned the hard way that if we don't moderate and bring solutions to the table, we'll find ourselves in an unsuccessful project with all the best intentions.

We sit shoulder to shoulder with the business, and when you're in a project team, you don't know who is IT or business. We really do sit together. That's how we basically moderate those debates. And we recommend solutions. It's much more than writing code or managing infrastructure; we're helping our business partners with their challenges. A successful IT employee is not just a coder — we actually understand our business. That's the role we've made for ourselves.

— *Interview by* Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

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THINK STRATEGICALLY, SPEAK STRATEGICALLY

As an IT pro, you know you need to think strategically — but can you speak strategically, too? CIOs share advice on how to catch the ear of senior management.

BY TRACY MAYOR

THE MESSAGE is coming in loud and clear from every corner of the tech and business sectors, from every career coach, hiring manager and trusted peer: IT pros who are serious about advancement need to think and speak strategically.

Keeping the lights on? Yawn. Transforming business processes? No-brainer. What organizations need in an IT leader now is a business strategist who can serve as a trusted colleague of, rather than merely a tech adviser to, C-suite executives.

"There has been a great movement toward strategic CIOs as executive teams recognize the crucial role that IT plays," says John Baldoni, chairman of the leadership development practice at N2growth, a Wilmington, Del.-based management consultancy.

Having being invited to the table, IT leaders need to contribute more than just operational expertise, says Baldoni, who has written several books on leadership. "It's not just 'What kind of tech solutions can I present?' it's knowing the mission, vision and values of the company, understanding its strategic imperative."

The message is getting through to IT professionals. In an exclusive *Computerworld* survey of 489 IT professionals conducted in August and September of 2013, respondents said the top three

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TOUGH QUESTIONS, BETTER OUTCOMES

WHAT'S THE NO. 1 BARRIER to delivering tech-centric solutions that align with your company's strategic vision? Business stakeholders themselves often don't know what they want, don't know why they want it, or want something that's out of sync with the strategic plan. Too often, IT goes along down the wrong path rather than having a difficult conversation at the outset of a project, says Debbie Madden, former CEO of software development firm Cyrus Innovation.

"People in the tech world are getting better about open and honest communication, but it's still too much of the business telling IT what to do and then IT just carrying it out," Madden laments. "That's not good for the business, and it's not good for the team of smart technical people you've assembled. At best, they'll build the wrong thing – and nobody wants that."

Having worked with hundreds of clients, Madden says she has learned to ask tough questions, and lots of them, at the outset of a project – "before things get political."

"I can't tell you how many times we asked, 'Why are we here? Why did you hire us?' and heard multiple answers," says Madden, who is in the early stages of starting a new tech company.

She encourages her teams to sit down the day before embarking on a new project for an internal risk-assessment meeting, where everyone touching the project lists everything that could possibly go wrong – "everything from 'they might hate us' to unreasonable deadlines to natural disasters like Hurricane Sandy," Madden says. The next day, the team shares its list with the client.

Madden acknowledges that it's counterintuitive to start off a new relationship with negativity, but she stands by the process. "I've never seen it backfire; I've only seen it help," she says. "The freedom to be honest allows us to continuously improve, and it ups our credibility when the client sees that we're in control."

– TRACY MAYOR

non-IT skills that they believe will make them most valuable are leadership and strategic thinking (cited by 24% of those polled), connecting with customers (16%) and analytical thinking (15%).

Moreover, 52% of the respondents said they believe the skill set that will best advance their IT careers is a business or soft skill, 32% said it would be an IT or technical skill, 12% said a skill that's specific to their industries, and 4% said they didn't know.

That said, IT professionals can be forgiven for wondering how they're supposed to add "articulate strategic imperatives" to a to-do list already overflowing with managing their teams, interacting with business partners, wrangling with vendors, budgeting, benchmarking and, as always, spinning up systems and services efficiently and effectively.

And even once they do manage to shift their mindset from functional to strategic, how do they convey that transformation, short of busting into the boardroom, Buddy the Elf-style, and shouting their ideas to a table of stunned executives?

Computerworld interviewed several seasoned CIOs to discover when they first emerged as business strategists and how they share that vision, both with their IT staffers and their C-suite colleagues.

The good news, the CIOs agree, is that IT pros are well positioned to learn how to both think strategically and speak strategically.

"Tech is actually a great career for strategic perspective," says Susan Doniz, chief information, digital and product officer at Aimia, a Montreal-based firm that develops customer loyalty programs for clients worldwide.

"I always said, 'I don't want to work in IT' — I was extremely interested in business processes, in how a business functions," says Doniz, who came to Aimia from Procter & Gamble Canada, where she was CIO. "But my path led me through tech, and it ended up being a good fit." Particularly in global organizations where technology touches every department and function, "you can see every part of the company — logistics, R&D, sales, international." That perspective, Doniz says, is a crucial element to building strategic insight.

> **Ask questions and get involved. Even if you're on what you might view as a pretty technical component of a project, try to understand the business context of the requests being made of you.**
>
> **TIM PETERSON,** CIO, WELLMARK

Know What the Business Really Wants

CIOs and career specialists agree that IT leaders can hardly be blamed for their lack of focus on strategic vision, given the way they've typically functioned within the organization up until recently.

"Historically, CIOs have been recognized and incentivized by technical achievements and a technical focus," observes Tim Peterson, executive vice president and CIO at Wellmark, a Blue Cross Blue Shield provider doing business in Iowa and South Dakota. "That hasn't encouraged a great deal of business, market or industry focus."

The easiest way to change that, say Peterson and other CIOs, is to flip it on its head and always think from a business, rather than a technological, point of view.

Stuart Beesley, interim CIO at Smiths Group, a global technology company headquartered in London, remembers well the first time that point was hammered home for him.

About nine years ago, Beesley was part of a team trying to launch a business transformation program for a particular division of Smiths. "The senior group colleague [on the business side] just could not understand what we were doing for him, and why," Beesley recalls. "I felt like I was banging my head against the wall."

Away from the office, Beesley was able to reflect on the situation, and he realized the miscommunication was happening around the way the project's outcomes were being described. "It was being pitched as a supply chain transformation, underpinned by ERP, with an opportunity to reduce headcount by eliminating touchpoints," he says — a description that wasn't resonating with the senior manager.

"I realized I had to turn that whole thing on its head and use business terms to say, 'This is going to work for you in this way and deliver these benefits,'" Beesley says. By enumerating the process improvements and business outcomes, he was able to get the buy-in he was looking for. Lesson learned: "If you're feeling frustrated," he says, "you need to step back and say, 'What am I not communicating here?'"

To the adage "Don't lead with technology, lead with the business problem," Doniz would add a trailer: "Don't let the business side lead with technology either." It's an increasing problem as technology pervades every aspect of the organization and beckons as a cure-all for every corporate challenge. "Don't let the business side say, 'Let's do something with Facebook' or 'Let's digitize,'" Doniz elaborates. "Get them to state the problem, state the goal, then fit the technology to the solution. That's strategic." (For more tips on talking to the business, see "Tough Questions, Better Outcomes" on page 14.)

Jim Forbes, CTO at University Health Network in Toronto, agrees that IT needs to be vigilant when the business side comes asking for a specific technology. "You need to ask the question, 'What are you really trying to solve?' You need to get closer to the business problem, and the way you do that is to keep drilling down and down to find out what they really want," he advises.

When managers at University Health Network said they wanted to "improve the patient experience," Forbes and his team qualified that by examining the entire process to identify which specific elements of the patient experience were subpar. "We went through and made sure we really understood their requirements," he says.

HOW TO **SPEAK** WITH PRESENCE

Your strategic insights aren't worth anything if you can't convey them with authority. Here's how to nail a boardroom presentation on the first try, in 10 steps.

1. Think about your message beforehand. Remind yourself that you know your stuff.
2. To begin, stand up or sit up straight.
3. Smile all around as you take a deep breath.
4. Start with the hook of your presentation, i.e., why you are speaking today.
5. Assume a neutral but authoritative tone.
6. Pause for emphasis when making key points, then explain them.
7. Summarize your key points in your conclusion.
8. Include a call to action, if appropriate.
9. Acknowledge tough questions openly.
10. Don't be afraid to say you don't know. Promise to deliver an answer at a later date.

ADAPTED FROM *THE LEADER'S GUIDE TO SPEAKING WITH PRESENCE HOW TO PROJECT CONFIDENCE, CONVICTION, AND AUTHORITY* BY JOHN BALDONI (AMACOM, 2013)

One key concern turned out to be the time patients were left in common areas or examination rooms waiting for doctors or test results — a challenging situation to improve, since it involves multiple departments and several different staffers. The solution is a smartboard application that shows nurses and clinicians how long patients have been waiting in any one area and tracks that against industry benchmarks.

Know Your Industry — and Others

As crucial as knowing the business is, it's only a first step, say Peterson and other CIOs. To be truly strategic, IT pros need to fully understand their industry and even cross-industry forces that will eventually impact their companies — not an easy task, Peterson points out, in complicated industries like healthcare that are roiling with change.

For midlevel IT staffers who aspire to rise through the ranks, that means homework, everything from reading trade publications and attending industry conferences to asking to be mentored by an appropriate executive.

"Ask questions and get involved," Peterson advises. "Even if you're on what you might view as a pretty technical component of a project, try to understand the business context of the requests being made of you. What are the senior executives' business goals for the project? How will the paying customers feel?"

And how will your industry — and beyond — react? Strategy means anticipating where your market is going and identifying the technological elements of that change, and also contributing IT perspective from other industries. "If senior leaders, and I include myself in this group, aren't thinking about how technology is being applied in relevant ways in other industries and other companies, we're being shortsighted," Peterson says. Just one example: As healthcare continues its customer-centric reform, it should take cues from the retail and financial services industries, he says.

Talk Strategy With Senior Stakeholders

All of your hard-learned strategic vision won't count for anything if you can't communicate it effectively to the right people, and that can be a challenge for IT folks.

"Anyone in a tech field probably hasn't spent as much time on public speaking as someone in marketing," says N2growth's Baldoni. "But the higher you go, the more comfortable you need to be speaking on your feet and speaking in public." (For some of Baldoni's specific tips, see "How To Speak with Presence" on page 15.)

Just who are the "right people"? Beesley advises casting a wide net. "You need to have networks of people within the business who understand you, and whom you understand," he says. This kind of relationship-building should be ongoing, not a last-minute effort you engage in only when you're in need of support. "If you take the time beforehand to build up trust, to have lots of ongoing conversations, then when you come along with bigger projects, it will be easier to build a powerful business case," he says.

Tom Van Winkle, director of information security at Alliance Data's Retail Services division in Columbus, Ohio, agrees that it's critical for IT people to socialize their ideas with senior decision-makers — not simply their immediate managers, but up the chain of command and throughout the organization. "You need to take personal initiative to engage in relationship-building," he says.

Van Winkle speaks from experience. He started out at Alliance working in the internal audit department, where he learned to look at all aspects of the business — including IT — with a critical eye. So when he transitioned to business security, he came with ideas for how the department could be re-engineered to better serve the needs of the company.

> **"Anyone in a tech field probably hasn't spent as much time on public speaking as someone in marketing. But the higher you go, the more comfortable you need to be speaking on your feet and speaking in public.**
>
> **JOHN BALDONI,** LEADERSHIP DEVELOPMENT EXPERT, N2GROWTH

Though his immediate manager was only "lukewarm," Van Winkle talked up his ideas with senior managers whenever possible — through mentor relationships, by volunteering to work on special projects where key stakeholders were involved, and in informal conversations he set up one-on-one.

The end result: Van Winkle is now in the manager's seat and his plan for realigning IT is well underway.

Talk Strategy With Your IT Staff

Brilliant as you are, you're only one person. To truly deliver strategic value to the organization, the entire IT staff needs to be energized in that direction.

"In order to create a vision, the staff needs to be part of the process," says Van Winkle. "I try to engage my managers in the planning process, which helps get people out of firefighting mode and take a step back to think strategically." Specifically, Van Winkle found that elucidating a two- or three-year strategic plan that addresses resources, personnel and tools helped staffers to shift their mindsets.

"There is a leadership component to being a strategic thinker," says Aimia's Doniz. "You need to have that people skill to bring people along with you." Especially in new, hyperconnected organizations where reporting lines are fuzzy, employees will need more than a simple direct-report relationship before throwing their support behind a strategic initiative.

"It's corny to say," Doniz says, "but it's true: A leader is not somebody with a title; a leader is someone people want to follow." ◆

CREATE YOUR OPPORTUNITIES

You have ideas, but how do you bring them to the attention of the people who matter? IT leaders share some tips:

- [illegible] advises Tim Peterson, EVP and CIO at Wellmark.
- [illegible] Ask questions, share your ideas and solicit their opinions, says Stuart Beesley, interim CIO at Smiths Group.
- [illegible] Peterson recently realigned Wellmark's IT department around multidisciplinary teams, creating a good opportunity for individuals to enhance their strategic roles.
- [illegible] says Tom Van Winkle, director of information security at Alliance Data's Retail Services division. If not, be brave and initiate one-on-one conversations with higher-ups to vet your ideas.
- [illegible] Debbie Madden, former CEO at software programming house Cyrus Innovation, was pleased when an employee who'd attended off-premises training set up an informal brown-bag lunch to share his knowledge. Such sessions are a good way to interact with business colleagues you might otherwise not encounter frequently.
- [illegible] advises Susan Doniz, chief information, digital and product officer at Aimia. Particularly in small or fast-growing companies, "there are lots of gaps in terms of what needs to be done and nobody doing it." If you worry you're not fully qualified, "fake it until you make it," she says.

[illegible]

Malware: War Without End?

After decades of fighting off cyberattacks and malware such as viruses, worms and Trojans, ultimate victory remains beyond reach, and possibly irrelevant.

BY LAMONT WOOD

CEASELESSLY, with no end in sight despite outlays that amount to a tax on doing business, the decades-long struggle against malware drags on.

Today, around 5% of the average IT budget is devoted to security, estimates John Pescatore, a director at the SANS Technology Institute.

Cybercrime (including malicious insider attacks and theft of devices) costs U.S. corporations an average of $11.6 million yearly, according to an October 2013 study by the Ponemon Institute that was sponsored by Hewlett-Packard's Enterprise

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Security unit. This cost represents a 23% increase over last year's average of $8.9 million per company.

Asked why malware is the war without end, experts commonly embrace either a military or an ecological metaphor. Those with the military viewpoint say flawed defenses have led to a stalemate. The ecology-minded don't see it as a war to be won or lost — they see an eternal cycle between prey and predator, and the goal isn't victory but equilibrium.

One who favors the military metaphor is David Hoelzer, director of research for Enclave Forensics in Henderson, Nev. "We are essentially going in circles," he says. "We improve only after our adversaries defeat our defenses. Most software is still riddled with vulnerabilities, but the vendors typically make no move to fix one until it becomes publicly disclosed. Coders are not trained in security, and 'well written' means 'under budget.'"

Security consultant Lenny Zeltser chooses the ecological metaphor. "Attackers take advantage of the defenders, and the defenders respond. It's part of the cycle," he says. "If attackers get in too easily, they are spending too much to attack us. If we are blocking 100% of the attacks, we are probably spending too much on defense. We have been in a state of equilibrium for some time and always will be. But being complacent is dangerous, as we must constantly apply energy to maintain the equilibrium."

Developments in the financial sector offer an example of why it's important to constantly apply energy to maintain the equilibrium. A new report from Trend Micro points out that attacks aimed at stealing online banking credentials recently surged to a level not seen since 2002.

Nevertheless, experts agree that progress has been made — even if only toward the maintenance of ecological equilibrium or a military stalemate.

Frequency of Cyberattacks

The frequency of different types of attacks experienced during a four-week period at 60 companies benchmarked.

Viruses, worms, Trojans	100%
Malware	97%
Botnets	73%
Web-based attacks	63%
Denial of service	50%
Malicious code	48%
Malicious insiders	42%
Phishing/social engineering	42%
Stolen devices	33%

SOURCE PONEMON INSTITUTE P ENTERPRISE SECURITY "2013 COST OF CYBER CRIME STUDY

The Wins So Far

At this point, "there are no types of malware for which there are no defenses that we are currently aware of," says Roel Schouwenberg, a researcher at anti-malware software vendor Kaspersky Lab.

"We no longer see the kinds of big, spreading malware that we saw three or four years ago, [such as] the ILOVEYOU virus of 2000," adds William Hugh Murray, a security consultant and a professor at the Naval Postgraduate School.

Interviews with analysts and executives at security vendors McAfee, AVG and Kaspersky Lab suggest that these are the four principal weapons that make this possible:

- **Signature detection.** This approach gives you the ability to spot malicious code, among other things.
- **Behavior monitoring.** By adopting this technique, you can do things like spot malicious activity in a computer or determine if a suspicious file will respond to virtual bait.
- **Blacklisting.** This is a mechanism for blocking access to sites and files that are included on a list of undesirable entities.
- **Whitelisting.** With this approach, essentially the opposite of blacklisting, users are allowed access only to sites and files on a list of entities known to be harmless; access is denied to sites and files that aren't on the list.

Each of the four has its supporters and detractors, and all the anti-malware software vendors we talked with for this story say they use some form of all four weapons, in combination.

Other defenses include firewalls, which can prevent intrusions and — with Windows at least — are part of the operating system, and periodic vendor patches to address vulnerabilities.

A question sometimes raised is whether there are more advanced weapons that we haven't yet learned about.

"I've heard that [the anti-malware vendors] have better defenses up their sleeve that they choose not to release since they are not necessary yet, and they don't want to tip their hand," says Zeltser.

The vendors deny this. "Our secret weapons are in force every day — it's a daily battle," says Tony Anscombe, an executive at anti-malware software vendor AVG Technologies. Indeed, if vendors had something that could stop all viruses, "it would be foolish to wait to use it," says Kevin Haley, spokesman for anti-malware software vendor Symantec. "It would be a competitive advantage" to help sell more software, he points out.

Either way, the end result is that anti-malware software vendors can now respond to a new (or "zero-day") exploit within two hours, although complicated exploits may require subsequent follow-up, says Haley.

In parallel, there have been efforts to make software less vulnerable to infection. For instance, Tim Rains, director of Microsoft's Trustworthy Computing group, says that Microsoft has revamped the code libraries used by developers to remove errors and vulnerabilities.

As a result, he notes, stack corruption was the vulnerability exploited 43% of the time in 2006, but now it's used only 7% of the time. He also cites a study conducted in 2011 by analyst Dan Kaminsky and others indicating there were 126 exploitable vulnerabilities in Microsoft Office 2003, but only seven in Office 2010.

Years of security-related software patches downloadable by users have also had a measurable effect. Rains cites statistics derived from executions of Microsoft's online Malicious Software Removal Tool, which showed that systems with up-to-date protection were 5.5 times less likely to be infected.

As of December 2012, the rate was 12.2 infections per 1,000 machines for unprotected systems versus 2 per 1,000 for protected systems. The global average was 6 infections per 1,000.

On the other hand, infections still happen. But even the nature of the infections seems to have reached a state of equilibrium.

Today's Attacks: Two Broad Categories

Roger Thompson, chief security researcher at security testing firm and Verizon subsidiary ICSA Labs, divides today's most common infections into two categories: APT (for "advanced persistent threat") and AFT ("another freaking Trojan").

New examples of APT malware appear about once a month, are aimed at a particular target and are produced by organizations with impressive resources, abilities and patience, he says. The classic example is the Stuxnet virus of 2010, whose goal appears to have been to make centrifuges in Iranian nuclear research labs destroy themselves by spinning too fast.

"Each one is different and scary," Thompson notes.

As for AFTs, self-replicating malware is no longer the infection vector of choice, with attackers preferring to launch drive-by attacks from infected websites against victims who were tricked into visiting. (However, worms and older malware are still lurking on the Internet, and an unprotected machine can still get infected in a matter of minutes, sources agree.)

Average Annualized Cost of Cybercrime

These costs are weighted by attack frequency in 60 companies benchmarked.

Denial of service	**$243,913**
Malicious insiders	**$198,769**
Web-based attacks	**$125,101**
Malicious code	**$102,216**
Phishing/social engineering	**$21,094**
Stolen devices	**$20,070**
Botnets	**$2,088**
Viruses, worms, Trojans	**$1,324**
Malware	**$997**

S[illegible]ON [illegible]/P[illegible]R RI E S[illegible] 1 CO[illegible] OF CY[illegible]R CR[illegible]UDY

The acquisition of new Trojans appears to be limited only by a researcher's ability to download examples; hundreds of thousands can be collected each day, experts say. Many examples are simply members of long-standing malware families that have been newly recompiled, and some malicious websites will recompile their payload — creating a unique file — for each drive-by attack. There are probably no more than 1,000 such families, since there is a finite number of ways to take over a machine without crashing it, notes Thompson.

The initial infection is usually a compact boot-strapping mechanism that downloads other components. It may report back to the attacker on what kind of host it has infected, and the attackers can then decide how to use the victim, explains Zeltser.

These days, an infected home system is typically hijacked by the attackers for their own use. With a small enterprise, the object is to steal banking credentials, while with large enterprises, the object is typically industrial espionage, Murray says.

New Battlefields Include XP, Android

But while many pundits expect to see a continued cycle of attack and defense, they also foresee additional future dangers: Windows XP may attract such heavy fire that it becomes unusable after Microsoft stops supporting it, and the Android smartphone environment may be the next happy hunting ground for malware.

For its part, Windows Vista is no longer receiving mainstream support, but Microsoft has said that it will continue issuing security updates for the operating system through mid-April 2017.

Windows XP, released in 2001, is still widely used, but Microsoft will stop issuing security updates for it after April 8. At that point, Microsoft will continue to issue security updates for Windows 7 and Windows 8, and after each one is issued malware writers will reverse-engineer it to identify the vulnerability that it addresses, Rains predicts.

"They will then test XP to see if the vulnerability exists there, and if it does they will write exploit code to take advantage of it," Rains says. "Since XP will never get another update, the malware writers will be in a zero-day-forever scenario. If they can run remote code of their choice on those systems, it will be really hard for virus protection to be effective. The situation will get worse and worse and eventually you will not be able trust XP."

"People should not be running XP," agrees Schouwenberg. "When it was written, the malware problem was very different than it is today. It had no mitigation strategies and is extremely vulnerable."

Android, meanwhile, is a huge target for crackers because it's so widely used on smartphones.

Experts see parallels between Android's development and the early Windows market, with hardware vendors adapting a third-party operating system for their products and no single party ensuring security. And in the Android market, the additional involvement of telecommunications carriers is a complicating factor.

"It is not like the case with Apple, which can push security updates to every iPhone in the world in one day," says Schouwenberg. "With Android, the manufacturer has to implement the patches and then go through certification with the carrier before the patches are deployed. Assuming your phone still gets security updates, it may be months before you get them. That would not be considered acceptable with a laptop."

"Android is in a position that Windows was in a few years ago: There is not enough protection," adds Johannes Ullrich, head of research at the SANS Technology Institute, which certifies computer security professionals.

"The good news is that it is relatively easy to defend against most malware, if you use up-to-date antivirus software, run a firewall, get security updates and use strong passwords," Rains says. "These techniques can block the major attacks used today and probably for years to come."

"The best practices I was telling people about 10 years ago I still have to tell people about today," Haley adds. "Have good security software, update the system and use good common sense. Don't link to email that doesn't seem right."

Finally, Pescatore suggests looking to the field of public health for a metaphor about living with malware. "We have learned to wash our hands and keep the cesspool a certain distance from the drinking water," he notes. "We still have the common cold, and we still have occasional epidemics — but if we react quickly we can limit the number who are killed." ◆

Wood *is a freelance writer in San Antonio.*

Courting Customers WITH Mobile Apps

IT is on the hot seat to step up its mobile game as businesses strive to get closer to their customers. Here's how three tech departments are meeting that challenge.

BY BETH STACKPOLE

Y**OU DON'T HAVE TO LOOK FAR** to witness the total domination of the mobile device. Whether on the commuter rail or at the soccer field, cruising the mall or navigating a bustling city street, people are seemingly constantly checking their smartphones and tablets to conduct the business of both their personal and their professional lives.

As a result, the mobile channel is opening up new ways for companies to nurture customer relationships. Via the deployment of strategic mobile apps, businesses can engage customers with a product or service anytime, anywhere and in a manner that's specifically tuned to their individual needs.

The mobile experience also delivers a rich set of data that provides hard-to-come-by insights into everything from a customer's buying behavior to his or her physical location. This data can

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allow companies to tailor the conversation to specific individuals while setting the stage for interaction that is all about gauging whether a shopper intends to make a purchase, says Chris Silva, an independent mobile analyst.

"If you've got customers, you've got mobile customers, and it's one of the few places where you can almost replicate the conversion potential that you have when someone walks into a store," he explains. "Anyone using a mobile app or accessing a mobile website is doing it as part of a task, so it's a model built around consumption."

Yet hand in hand with this powerful business opportunity come some unique development challenges for enterprise technologists. IT is being tasked with building an app portfolio that supports a wide range of mobile platforms, including smartphones and tablets, amidst a continually changing landscape of operating environments, from Apple iOS to Android and Windows 8.

Adding to this backdrop of complexity are the vastly accelerated delivery schedules for mobile apps — weeks as opposed to the months or years of traditional IT projects — and the fact that many IT staffs, already strapped for core talent, are lacking the requisite mobile development skills, forcing them to hire up or turn to outside partners.

"Most mobile strategist roles and groups are in their infancy today," says Silva, who notes that internal IT departments need to prove that they have the chops to be taken seriously as mobile developers.

Despite the scope of the task, the opportunity to leverage mobile as a means of improving customer relationships is too potent to ignore. Here's a look at how three IT organizations in different industries are rising to the challenge and making mobile a centerpiece of how their companies forge tighter bonds with customers.

> **"We opened up eight [mobile] channels in two and a half years, and they all have the same integration on the back end, but look different based on the brand.**
>
> **MARLO DONATE**, CDO, TOYOTA FINANCIAL SERVICES

Freeman Co.

An app tackles the trade show grind.

- **Location:** Dallas
- **Line of business:** Provider of business services related to trade shows and other events
- **IT staff:** Approximately 100 employees
- **The mobile opportunity:** Navigating a trade show is difficult enough for attendees, but it's exponentially more challenging for exhibitors trying to juggle all of the logistics. Freeman's exhibitor customers often complained about the long walks to the service desk to report problems, the lengthy post-show checkout process and the lack of timely access to freight information.

To address those concerns, the company in 2009 launched a service through which Freeman customer service reps on the trade show floor got mobile access to a Web-based tool that helped them troubleshoot problems.

It soon became clear, however, that exhibitors wanted to handle logistics and solve problems on their own. "Our customers are at a show site in a convention hall surrounded by stuff, and having a [non-demo] PC is not really an option, and if they do, connectivity is questionable," says Richard Maranville, an executive vice president and CIO at Freeman. "That led us to mobile pretty quickly."

- **What was launched:** Maranville's team partnered with business colleagues in customer service and marketing to develop an app called Concierge Elite, which was made available to customers about two years ago. The mobile app — initially available for iPhones and iPads and more recently for Android and Windows 8 devices — streamlines the exhibitor experience. It lets customers get basic information about the event while also delivering a variety of services, including the ability to place orders for booth equipment, submit trouble tickets and orchestrate post-show checkout without having to stand in line. Another feature of Concierge Elite is a freight alert capability, which notifies exhibitors via text or email when their freight has arrived in the booth so there's no waiting around and no mix-ups, Maranville says.
- **The technical details:** Using Web services, the individual functions (trouble tickets, checkout and so on) are stitched together via a messaging software layer running at the show site that hands off information between the local distributed apps and Freeman's back-end, Java-based e-commerce and operations systems — an approach that helped speed up development time, Maranville says.
- **The greatest pain point:** The primary challenge to pulling off Concierge Elite was navigating the ever-changing mobile device landscape, Maranville says. To do that, Freeman used a development tool called PhoneGap to provide a layer of abstraction around the app so it could easily be ported to different platforms and screen sizes and deployed in the different app stores. "Right now, our biggest challenge is staying caught up with all the devices and operating systems so we can provide the best experience without being tied to a specific device or screen size," Maranville says.
- **The payoff:** Concierge Elite cost less than $500,000 to develop, and the payback has been "huge" in terms of improved customer service, according to Maranville. Since the mobile strategy has been in place, Freeman's score on a customer service metric has gone up by 300 basis points, and feedback has been positive. "Our focus has always been on customer service, but we saw [mobile] as a lever that can make us even better," he says.

Toyota Financial Services

IT proves its mobile mettle.

- **Location:** Torrance, Calif.
- **Line of business:** Financial services
- **IT staff:** 150 employees
- **The mobile opportunity:** With a mandate from the CEO to improve the customer and dealer experience, it was a no-brainer that Toyota Financial Services (TFS) would deliver a mobile app to give customers access to key services on the go. What was open to question was whether the internal IT team would spear-

head the project or whether it would be handed off to an outside player considered to have deeper experience in mobile development practices. (Spoiler alert: IT got the job.)

- **What was launched:** The Mobile Click to Pay project encompassed a series of mobile apps for the Toyota, Lexus and Scion brands. The apps supported bill payment and simple account access and included a dealer locator, among other things. Mobile websites were launched first for Toyota and Lexus in January 2011. These were followed by iOS versions of apps for each of the three brands in October 2011, and then by Android apps in October 2012.
- **The technical details:** Developed with reuse in mind, the apps were conceived as an extension of TFS's retooled consumer website. As opposed to taking a native development approach for each mobile platform, TFS chose to build the app portfolio on a foundation of federated security and Web services, including the REST open-source Web services technology.

The idea, says Marlo Donate, chief digital officer, was that once developed, the apps could quickly be ported to multiple mobile platforms. Case in point: While it took eight months to develop the Toyota Financial Services and Lexus Financial Services mobile websites, subsequent development of Mobile Click to Pay Android apps took only three and a half months.

"We opened up eight [mobile] channels in two and a half years, and they all have the same integration on the back end, but look different based on the brand of vehicle," Donate explains.

> **"We wanted to have some sort of self-service option for customers in a post-PC era when everyone walks around with a smartphone or tablet.**
>
> **MUJIB LODHI**, CIO, WSSC

- **The greatest pain point:** During the initial scoping of the Mobile Click to Pay project in mid-2009, the business side wasn't fully confident that IT could deliver on the vision to leverage mobile as a way to offer a higher level of service and open up new payment channels, Donate admits. The aha moment came when both sides were together in a room, with marketing brainstorming an innovative concept — making it possible for customers to set up the mobile payment system simply by swiping a bar code printed on their billing statements — and IT saying it could quickly prototype such functionality. "This was the turning point in the relationship between IT and business," Donate says. "It established trust and the sense that we could work together better."
- **The payoff:** While declining to discuss project costs, Donate says the customer response has been huge: Without any marketing, there were 297,224 downloads of the iPhone apps and 45,165 of the Android apps in the first five months, she says.

WSSC

An app mobilizes customer self-service.

- **Location:** Laurel, Md.
- **Line of business:** A water and wastewater utility serving suburban Washington, D.C.
- **IT staff:** 94 employees
- **The mobile opportunity:** With 1.8 million residents spread across 1,000 square miles of metropolitan and suburban Washington, D.C., and a customer service center fielding more than 50,000 calls a month, the Washington Suburban Sanitary Commission (WSSC) was hungry for a way to let customers help themselves without sacrificing its level of service. The rise of mobile computing provided the right opportunity. "We wanted to have some sort of self-service option for customers in a post-PC era when everyone walks around with a smartphone or tablet," says Mujib Lodhi, WSSC's CIO. "We wanted customer intimacy, so why not connect directly to them?"
- **What was launched:** WSSC Mobile, which made its debut in 2011, allows customers to pay bills, report problems and monitor their water usage without having to wait for phone assistance. Using integrated GPS capabilities, WSSC Mobile also lets people track the status of their issue and view a map of any current problems in their area.

The app is also a way to enlist the public in identifying problems, helping the utility's small team of experts police the entire service area. "It creates a partnership with customers so if they're out for a morning jog and see a leaky hydrant, they can pull out their smartphone, snap a picture and submit it and, based on the geographic coordinates, WSSC can immediately dispatch a crew to take care of it," Lodhi explains.

- **The technical details:** To keep costs in check, WSSC leveraged existing tools to create the mobile app, including Esri's ArcGIS suite for spatial applications, IBM's WebSphere suite for all J2EE applications and Oracle for the RDBMS.

The team also took a hybrid development approach to minimize platform-specific programming, while still delivering a device-specific user experience, Lodhi says. Specifically, they employed an open-source library-wrapper framework, which included jQuery Mobile for screen navigation and design; JavaServer Faces MVC framework for business logic process; Dojo for asynchronous calls; and Objective-C to create application wrappers for iOS, Android and BlackBerry devices.

- **The greatest pain point:** Integrating the app with the GIS system and getting the user experience right was IT's biggest technical challenge, Lodhi says. Initially, when IT presented a prototype of the app, people on the business side weren't impressed and sent the team back to the drawing board to optimize the look and feel for a truly mobile experience. "We wanted to give customers an excellent experience so they'd use it," he says. "We paid attention to the feedback and went back and fixed it."
- **The payoff:** All in all, Lodhi estimates the project cost $200,000 or so. It delivered value by reducing both call volume and call handling times as well as paper expenses, since more customers are seeking information online. The team has steadily added new features to WSSC Mobile with fresh releases about every three months. To date, about 10,000 customers have downloaded the mobile app, and WSSC's goal is to get to 150,000 user downloads in the next three to five years. ◆

Stackpole, *a frequent* Computerworld *contributor, has reported on business and technology for more than 20 years.*

Security Manager's Journal

MATHIAS THURMAN

Eyes Wide Open on Data Loss

Combining existing network data loss prevention with endpoint DLP will reveal more hidden network recesses.

Trouble Ticket

» Network DLP has been worthwhile, but it has shortcomings.

» Add endpoint DLP. It also has limitations, but the two work well together.

IMPLEMENTING TECHNOLOGY to monitor user and network activity can be an eye-opener.

Our security incident and event management tool made us suddenly aware of the magnitude of infestation on our network. When we deployed incident-detection and incident-prevention systems on our firewall, we were amazed at the number of hacking attempts against our Internet-facing resources.

We had a similar revelation when we implemented network-based data loss prevention (DLP). Within a few days of lighting it up, we had discovered a wide variety of data leaking from the company and had even uncovered illegal activity (an employee conspiring with someone from outside of the company to commit a crime). So network DLP is another win, but it has its problems.

First, we can monitor network traffic only at locations where we've installed a network monitor. Our company has more than 60 offices worldwide, and until we re-architect the network, each office has its own Internet connection, which means that we would need to deploy 60 sensors and configure 60 switches. That's a logistical nightmare. Second, without complicated proxy configurations at each remote office, we can't monitor encrypted network traffic. And finally, we can't monitor the Internet traffic of employees who go off the network (by working remotely, say) unless they are connected via VPN.

To address all of this and more, we decided to run a pilot of endpoint DLP.

Endpoint DLP has some shortcomings. For example, unlike network DLP, it won't let you conduct complicated data index matching. With data index matching, you can identify to the DLP system the text of documents deemed to be sensitive. Then, if a user copies just a few lines from an identified document and pastes them into another document or email, the DLP system would detect that activity and block it or send an alert. That level of detection is not quite available with endpoint DLP.

the discussions about security! **computerworld.com/blogs/security**

Nonetheless, endpoint DLP does offer several advantages. For one, it gets around the problem of encrypted traffic, since it monitors activities before encryption takes place. It also stays on the job when a user is off the network. And it can spot when data is moved to external media, such as a USB flash drive.

Our pilot deployment of endpoint DLP involved about 200 IT personnel around the world. After some initial tuning, the results were almost immediate. Within hours, we observed a senior-level IT engineer copying a huge number of sensitive Active Directory configuration files and employee directories to an external USB drive. In all, he copied about 3GB of data, including 2GB of archived email.

Teamwork

That seemed suspicious enough, but the real payoff came from the way network DLP and endpoint DLP complement each other. The same IT engineer had been flagged by our network DLP, which sent an alert about him based on the "I'm leaving" rule, which instructs the system to look for any communications suggesting that someone is planning to leave the company. We wouldn't have paid attention to that notification if the endpoint DLP hadn't also alerted us to the fact that he was copying data. We talked to the engineer, he gave us the USB drive, and HR reminded him of the confidentiality agreement he had signed.

Naturally, we highlighted the case of the departing IT engineer in building our business case for a global deployment of endpoint DLP early next year.

If we get the green light, we'll do a lot of tuning to reduce the number of false positives and to make sure we don't monitor personal activity involving things such as finances and healthcare. But it looks like we're going to have our eyes opened again, this time by endpoint DLP. ◆

This week's journal is written by a real security manager, **"Mathias Thurman,"** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

> **"The results from our pilot deployment to about 200 IT personnel were almost immediate.**

OPINION

PRESTON GRALLA

Patents Don't Equal Innovation

> Today, lawyers at times have as much influence as engineers, if not more.

ANYONE LOOKING at the list of companies receiving the most patents in 2013 might think that Microsoft has been releasing some of the world's most innovative products, that BlackBerry is one of the most innovative companies on the planet, and that Apple and Google are embarking on new innovation agendas. But they'd be wrong, of course, because patents don't necessarily equal innovation.

In January, IFI Claims Patent Services released its annual list of companies with the most patents issued by the U.S. Patent and Trademark Office, and Microsoft, perennially on the list, was ranked No. 5, up from No. 6 in 2012. (IBM was No. 1, retaining its spot as the top patent-getter for the 21st year in a row.)

Microsoft's patent portfolio might lead you to believe that it was churning out innovative products. But that's far from the case. Windows 8 underwhelmed analysts and consumers in 2013. The company had to take a $900 million writedown on unsold inventory of Surface RT tablets, and it continues to lag far behind in the smartphone and tablet markets, where innovation matters most.

As for No. 20 BlackBerry, it broke into the top 20 for the first time in 2013, jumping from No. 29. But no one would argue that 2013 was an innovative year for BlackBerry. Its Z10 and Q10 smartphones did so poorly the company had to take a $960 million inventory writedown, and by the third quarter, its market share had plummeted to a lowly 1.5%, according to ABI Research.

Apple also jumped into the top 20 for the first time, at No. 13, yet 2013 was a year in which the shine was off the company, as it introduced no new major innovations and focused primarily on shoring up existing businesses. Similarly, Google entered the top 20 at No. 11, yet one can't point to any major, groundbreaking new products the company released.

So where's the disconnect?

It's that patents don't necessarily equal innovation. That's not even their ultimate purpose for some companies. Today, lawyers at times have as much influence as engineers, if not more, and patents are used to fend off competitors and to force them to pay licensing fees that can run to billions of dollars annually.

Microsoft is a prime example. It has targeted manufacturers of Android devices, claiming that they are violating its patents, in order to get them to sign licensing agreements. Those agreements bring in $2 billion a year in royalties, according to financial analyst Rick Sherlund. In April 2013, Microsoft said that it had royalty agreements "with nearly all companies on the list of the world's largest Android smartphone vendors and their manufacturers," and that 80% of all Android smartphones sold in the U.S. were covered by those agreements.

Microsoft isn't alone. Apple has used patents in a similar manner, notably in its suit against Samsung. And the people who believed that Google purchased Motorola in 2011, not for its manufacturing prowess but for its sizable patent war chest, have been vindicated by the news that Google is selling Motorola but keeping its patents.

That doesn't mean that companies like Microsoft, Apple and Google should cut back on research and stop pursuing patents. It's good that U.S. companies are on the list of the biggest patent holders. But it would be better if those patents were put to their best use, developing innovative products, rather than being deployed as a means of bludgeoning competitors. ◆

Preston Gralla is a *Computerworld.com* contributing editor and the author of more than 35 books, including *How the Internet Works* (Que, 2006).

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Career Watch

THINKSTOCK

Forrester Expects a **Big Rise in Tech Spending** This Year

But the forecast 6.2% uptick won't match double-digit growth of years gone by.

$2.2
TRILLION
FORRESTER RESEARCH ESTIMATE FOR TOTAL GLOBAL TECH SPENDING IN 2014

Forrester Research is forecasting that global technology spending will rise 6.2% in 2014 from 2013, to reach $2.2 trillion. The U.S. share of that total will come to 40%, it said.

If the prediction bears out, it will be an improvement: IT spending grew 1.6% during 2013, according to Forrester analyst Andrew Bartels. Growth will quicken in 2015, rising 8.1%, but will remain "well below the double-digit growth rates of the late 1990s and 2000 era," Bartels said in a blog post in late December.

Software will account for the largest share of tech spending in 2014, at $568 billion, followed by IT outsourcing at $442 billion, IT consulting and integration services at $421 billion, computer equipment at $416 billion and communications equipment at $373 billion, according to Forrester's report.

– CHRIS KANARACUS, IDG NEWS SERVICE

Percentage of hiring professionals who cited pay as a reason for tech veterans leaving their current employer.

SOURCE: DICE SURVEY OF 860 HUMAN RESOURCE MANAGERS, RECRUITERS AND CONSULTING AND STAFFING COMPANIES, NOVEMBER 2013

75%

Q&A

Rona Borre

The CEO and founder of Instant Technology talks about the **skills most in demand** *in 2014.*

What IT skills do you see as being most in demand in 2014? The IT market is constantly evolving, as it's driven by innovation. The talent pool is always striving to keep ahead of the curve as new technologies are adopted by organizations. With more and more applications moving to the Web and mobile, user-experience developers and security engineers are in growing demand. Systems and applications have to be remapped and redesigned for these new platforms, and new security measures have to be put in place to deal with the higher connectivity of the applications.

We're also seeing a change in how we store and analyze data. As a direct result of new forms of data capture, big data is becoming important for more and more companies. Systems like Hadoop make it easier for companies to store data such as images, videos, audio and even geocaching. The analysis of this data opens up new avenues for how companies interact with their customers, and as a result big data professionals will certainly be in increasingly high demand through 2014.

Why are some needed skills in short supply? Technology is playing a bigger role in every organization as more systems and functionalities move to the cloud. As more companies realize that they need these types of professionals, they all have to fish in the same, already-small pool of talent. Several of these technologists have learned that there is a great deal of money to be made as a contractor, which shrinks the pool of available full-time talent even further.

Top-tier, full-time technology talent has always been in high demand, and even through the recession, unemployment numbers stayed well below 1%. As more companies invest more money in bringing A-players in technology into their organization, we can expect that number to continue to dwindle.

What related skills are good building blocks for acquiring these most-wanted skills, and what's the best way to go about acquiring the more in-demand skills? It is critical that technologists continue to expand their skills into the Web arena. Applications and services are making the move to not only the Web space, but also to mobile. Any increase in marketable knowledge in these areas will prove valuable to a professional in technology. Asking to be a part of projects that utilize new technology or even joining professional organizations that work with more up-to-date or cutting-edge technology could help in bolstering a candidate's marketability.

– JAMIE ECKLE

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Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: D. Racherla Please reference job # below:

Web Developer (San Bruno, CA) **#1615.5386** Design, develop, modify, and/or test Google's web-based systems, architecture, and related features. Exp Incl: Unix or Linux syst; ActionScript & Jscript; web tech; script lang; & dvlpmnt of apps for embedded pltfrms for set topboxes or smart TV w/ memory & processor resource constraints.

Software Engineer (San Bruno, CA) **#1615.6184** Design, develop, modify, and/or test software needed for various Google projects. Exp incl: OOP lang; web tech; HTML; script lang; & AJAX & REST methodologies.

Software Architect-General:

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Software Engineer Positions (Kirkland, WA); Design, develop, modify, and/or test software needed for various Google projects. Exp incl:

#1615.3834 C++, Java, or Python; comp ntwrk & media streaming technology; backend sw; distrib syst algorithms & distrib fault-tolerant designs; data structs, algorithms, & perf analysis of large-scale distrib systs; & debug of large-scale distrib syst.

#1615.1537: Java; Android frwrk; Git; mobile appl dvlpmnt; interaction design, application design, & application UI design; design & dvlpmnt of sw for consumer electronics; dvlpmnt of social ntwrk appls; & SQLite to store appl data.

#1615.5466: C++; HTML5; JScript; algorithms; & source control.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: D. Racherla. Please reference job # below:

Systems Administrator(Venice, CA) **#1615.4923**; Maintain and administer Google's computer networks and related computing environments. Exp incl: UNIX &/or Linux; syst admin; shell script; Python; syst admin automation; ntwrkng; TCP/IP; OS internals; syst troubleshoot; SQL database; Windows admin; VBScript; & PowerShell.

Software Engineer Positions (Venice, CA); Design, develop, modify, and/or test software needed for various Google projects. Exp incl:

#1615.5664; OOL; script lang; data struct & algorithms; web srvcs; app srvrs; ntwrkng & databases; human cognition & front-end UX design; & srvr monitoring, troubleshoot, syst updates, & releases.

#1615.4895; Java; distrib syst; relational & non-relational databases; SQL; IDE; Code Versioning System; Bash; C++ & Python; syst design; UNIX &/or Linux; Issue tracking; & code audit.

Sr. Web Application Developer (Charlotte, NC): Dvlp, create, & modify general computer apps or specialized utility programs. Analyze user needs & dvlp web app solutions; design or customize apps for client use w/ aim of optimizing operational efficiency; analyze & design databases w/in an epp area. Reqmt: Bach degree or equlv in Bus. Admin., CIS, Engg, Math,Tech, or a rel field. 5 yrs of exp In job offered or rel occupations of Sr. Dvlpr, .NET Dvlpr, or S/W Engineer II. Exp must include testing & troubleshooting apps, dvlping & designing, Implementing, & customizing windows & web apps using C#, .Net, SQL, Web Services, Visual Studio. We offer competitive salaries & benefits. Please email resumes to Attn: Dan Good. Email:dan.good@electrolux.com.

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Software Engineer Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp. incl:

#1615.3762 C & C++; comp ntwrkng; SSL, HTTP, & TCP Internet protocols; proxying & caching; perf & scalability analysis & optimization; Linux & Unix syst internals; sw dvlpmnt lifecycle; data struct & algorithm design & analysis; & tech leadership.

#1615.6140 C++ or Java; Python; MapReduce; data mining stats & techniques; design & implement of algorithms; large scale data proces; backend dvlpmnt; & frontend dvlpmnt.

#1615.7676: Java; C++; JScript; HTML; CSS; AJAX; data analysis & large scale data sets; & web dvlpmnt tool.

#1615.2409 appl-lvl vulnerability testing; code-level security auditing; web appl security; C &/or C++ code vulnerabilities; Linux syst security & appl sandboxing; Linux kernel dvlpmnt; web browsers &/or client sw; web security models; & web tech & protocols.

#1615.5403 C++; Linux; SQL; AdWords; distrib syst; & optimization of online ad campaigns.

#1615.1507: progr Java; large syst sw design & dvlpmt; collaboration w/ research oriented teams; multi-tier client srvr arch; Android; srvr-side ranking improvements & algorithms; data structs & sw design.

#1615.6938: dvlp storage device techn; dvlp SATA &/or PATA command & transport layer; C &/or C++; oper syst &/or kernel dvlp.; debug; ntwrk stack; script lang; & assembly lang.

#1615.4587: C++ & Java on Linux; Android dvl; server Infrastruct develop; multi-thread & OOP; Python, SQL, HTML, & shell scripting.

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Business Systems Integrator (NY, NY) **#1615.3910** Design analytical solutions that answer complex business decisions.Exp incl: Java, IDE, HTML, CSS, Jscript, & XML; creation of pltfrm components; design & Implement desktop & web apps; & OO sw.

Network Systems Engineer (NY, NY) **#1615.5231** Design, implement, and operate the global scale Google production software defined networks. Exp incl: tech troubleshoot & perf tuning; TCP/IP-based protocols; routing & ntwrk mgmnt protocols incl TCP/IP, BGP, OSPF, IS-IS, HSRP, VRRP, & SNMP; & enterprise & carrier-class routers & switches.

Site Reliability Engineer (NY, NY) **#1615.3021** Provide technical support necessary to ensure full availability of Google online services. Exp incl: syst eng'g in critical prod environ; manage a team of eng'rs; design of large scale distrib syst; Linux & Linux syst internals; IP ntwrkng, ntwrkng protocol, load balancing & load balancing algorithms; hw syst & integration; Python & Unix shell script; clustering, distrib syst & Mapreduce tech; storage syst & storage tech; & Windows oper syst internals & mgmnt.

Software Engineer Positions (NY, NY); Design, develop, modify, and/or test software needed for various Google projects. Exp incl:

#1615.6436 C++, Java, & Python; data struct & algorithms; comp pltfrms & browsers; & design, implement, test, & maintain comp syst & code bases.

#1615.5831 Jscript; Java; flex web arch; HTML; CSS; & web app dvlpmnt using AJAX.

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Software Engineer (Irvine, CA) **#1615.1121** Design, develop, modify, and/or test softwere needed for various Google projects. Exp Incl: C++ or Java on Linux; multi-thread & parallel prog; OOD; large scale distrib syst design & dvlpmnt; distrib syst simulation & perf analysis; cloud storage syst; linear & non-linear optimization prob; info security & applied cryptography-website dvlpmnt flow; & HTML, XML, CSS, Jscript, AJAX, Shell, & SQL.

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Software Engineer In Test (Kirkland, WA) **#1615.4513** Design, develop, modify, and/or test software needed for various Google projects. Exp Incl: C &/or C++, Java; Python; SQL; large-scale data analyzing; hashing; dynamic prog & multi-thread prog; parallel & distrib computing; & REST srvcs, ntwrk traffic & perf monitoring syst dvlpmnt.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: D. Racherla Please reference job # below:

Software Engineer positions (San Bruno, CA) Design, develop, and/or test software needed for various Google projects. Exp incl:

#1615.6066 SQL; Python, Perl, or Bash script lang; Java; C++ or C; OOP; Linux; data analysis; & algorithms & data struct.

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#1615.5893 C++ & Python; Linux; distrib & oper syst; algorithms; & large-scale sw syst.

#1615.6895; C, C++, Java, or Python; script lang; sw dvlpmnt in test; Unix & Linux environ; serving & indexing infrastruct for web srvcs; algorithms & data struct; comp ntwrks; & distrib syst sw design & dvlpmnt.

Anti Abuse Engineer (Mountain View, CA) #1615.6708 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: Java, C++, Perl, Python, PHP,or SQL; numerical analysis, algorithms or data-mining; Jscript or HTML; bldng & maintain web apps; & identifying anomalies in large data sets.

Software Engineer Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp. incl:

#1615.1287 application layers incl backend, frontend, web & mobile clients, using C, C++, Java, Jscript, Python, & Bash; relational & distrib databases, & distrib file syst; design for fault tolerance & perf in distrib syst-work with large codebases & legacy syst; algorithm design & optimization; concurrency & multithread; & image process.

#1615.958 C & C++; data mining; multithread; STL; Java; Python; mach learn; parallel, scalable & distrib computing; & MapReduce or Hadoop.

#1615.456 distrib syst; parallel & distrib prog, incl parallelism patterns; web dvlpmnt in MVC model; Java; & message-oriented Middleware.

#1615.4770 single-thread & multithread prog in C++ w/ STL, C, or Java; Python or Bash; data analysis lang &/or data mining lang; mach learn, info retrieval, data mining, or nat lang process; perf tuning & debug; distrib compute workflows; & design of controlled experiments & experiment data analysis.

#1615.5574 dvlpmnt, testing, & enhancement of prod &/or syst utilities; design implementation, testing, & maint of comp syst; distrib info syst; Java, C, C++, or Python; & sw testing, version ctrl, & release mgmnt.

#1615.6131 obj C; Java, C, &/or C++; design patterns; design of sw apps; OOD & dvlpmnt; Internet protocols; multithread; hashing; bldng UI based apps; & algorithms & data struct.

#1615.2275 C, C++, & Java; UNIX, Linux, & AJAX; writing code for web-based apps; distrib syst & ntwrkng infrastruct; OS kernel; ntwrk syst design; & IDEs, large-scale build syst, & compilers.

#1615.7776 data struct, algorithms, & sw design; large-scale syst sw design & dvlpmnt; Unix & Linux; Java & C++ dvlpmnt; Python; & distrib computing, info retrieval, data mining, & mach learn.

#1615.1046 C++; multithread; adv algorithms & data struct; parallel prog; translation of specs to design & implement complex syst; unit & integration syst; large-scale distribsyst; distrib databases; design of fault tolerance & recovery methods; & MapReduce.

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Software Engineer in Test (Mountain View, CA) #1615.6547 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: C++; sw testing; adv data struct; algorithms; OOD; mutation test; & distrib computing.

Network Test Engineer(Mountain View, CA) #1615.6724 Design, develop, and execute test plans for networking features, equipment,and systems. Exp incl: standard L2 &/or L3 protocols; access ntwrk protocols; Unix &/or Linux; C &/or C++; script lang prog; ntwrk syst; ntwrk testing of access ntwrkng prod, CPE devices, &/or traditional wired routing & switching equip; & design, implementation, & support of Internet ntwrks.

System Administrator (Mountain View, CA) #1615.3108 Design, develop, modify, and/or test software needed for various Google projects. Exp incl: syst admin; Linux; Windows Srvr, SCCM, MSSQL, & IIS; puppet configuration mgmnt; ntwrkng; C &Python coding; & HTTP srvrs.

Software Engineer Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp. incl:

#1615.6791 multithread prog; parallel process of large data sets; Unix & Linux; fault-tolerant syst; Internet protocols; STL; & design, implement, debug & perf analysis of large-scale distrib syst in C++.

#1615.6526 C & C++; multihread; STL; Java; AJAX, XML, HTML, & Jscript; Python & shell script; SQL; algorithms & data struct; large-scale distrib syst & large-scale distrib process; & local mobile use cases.

#1615.8041; prog models, frmwrks, runtime syst, & libraries for parallel & distrib computing; large scale perf analysis & optimization of parallel sw; numerical algorithms, data mining, or mach learn; C++ & Python; debug & profiling tools; script lang; & data struct & algorithms & their use in sw design.

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#1615.6728 prog & debug in Java; Jscript, HTML, & CSS; distrib syst; large syts sw design & dvlpmnt; Unix &/or Linux; data struct; & algorithms.

#1615.6288 browsers & comp pltfrms; Java & GWT; Eclipse or IntelliJ dvlp tools; web std, protocols, & Ajax; data struct & algorithms; prod feat or syst components; design, implement, testing, & maint of comp syst; large-scale syst sw design & dvlopmmt; & mach learn & text classification.

#1615.5675 C++; multithread; algorithms & data struct; parallel prog; translation of specs to design & implement sw syst; unit & integration test; large-scale distrib syst; distrib databases; design of fault tolerant & recovery methods; & MapReduce, Stubby, Borg, &/or Bigtable.

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Hardware Engineer (Mountain View, CA) #1615.5497; Design, develop, modify, and/or test hardware needed for various Google projects. Exp incl: progr & quality mgmt; mgmt & review of factory yields for root cause & failure analysis of top issues; support of industrial designers on material & cosmetic matching parameters; bus process design, analysis, & improvement; automation test fixture design & implement; & Six Sigma. Trvl Rqrd.

Test Engineer (Mountain View, CA) #1615.8250: Design, develop, modify and/or test various google projects. Exp incl: Java or Python; JUnit & WebDriver; Internet tech; Linux environments & shell script; API test; sw test automation; test of web-appls; test methodologies, test automation techniques, & debug; version control; & bug-track, writing test plans & test cases, & test-case mgmt syst.

Network Engineer (Mountain View, CA) #1615.7411; Identify issues for Google's networks and determine appropriate solutions. Exp incl: large ntwrk infrastruct & ntwrkng; optical ntwrks; wireless or enterprise environments; & protocol families. Trvl Rqrd.

User Interface Designer (Mountain View, CA) #1615.5830: Define the information architecture and user interface for new and existing Google products and features. Exp incl: design web-based prod. for consumer-oriented web & apps; creating design syst. for web apps. across desktop, tablet & smartphone platforms; online advertising or related domains; collaboration w/ user researchers, prod. mgrs., & engr.; interaction design, incl. info. architect. & workflow design; visual design, in be Photoshop &/or Fireworks.

Industrial Designer (Mountain View, CA) #1615.440: Combine artistic talent with research on product use, marketing, & materials to create functional & appealing product designs for Google. Exp incl: CAD; rendering sw; 2-D soft. & present. tools for design visualization, presentations & documentation; develop. of consumer electronics prod; & design proposals demonstrating form dvlpmnt & usability of consumer prod.

Technology Manager (Mountain View, CA) #1615.6916: Take responsibility for Google products from conception to launch. Exp incl: Python; Java; SQL; data mining; financial modeling & databases; & collaboration w/ & giving presentations to exec or Sr lvl officials.

Software Engineer in Test positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp incl:

#1615.1179: C or C++; Java; JScript; Python; data struct & algorithms; OO syst design & dvlpmnt; multi-thread progr; build syst; test automation; Guice & Guiceberry; WebDriver; & GWT.

#1615.5138; sw dvlpmnt; sw test & test automation; C++; Java or C#; data struct & algorithms; OOD; relational databases; distrib comp; sw testing methodologies; & Linux or Windows.

SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

HAL MAYFORTH

[redacted]

Oh, Yeah, One More Little Thing …

IT manager pilot fish at a company that makes paving materials gets a call from a plant manager: Asphalt manufacturing has stopped because a keyboard stopped working. "I questioned him further," says fish. "He said that the computers were up and running and the keyboard was plugged in. He just couldn't control anything because the keyboard was unresponsive. After this quick review, I grabbed a few keyboards and my tools and drove the 120 miles to the plant location. What I found was truly disturbing. There, where the keyboard was supposed to be sitting, was a molten mess of plastic. When I asked what happened, the plant manager added one important detail. Holding up a bottle of industrial-strength asphalt cleaner, he said, 'I was only trying to clean up the keys.' "

It's About Time

This department head is always the last one to arrive at the many meetings she attends – and that's making other attendees unhappy. "She also organizes and emcees perhaps half of the meetings, but she's always the last one in the room, even as meeting organizer," says an IT pilot fish in the loop. "Some hubbub was made to be on time for meetings, so being late would result in receiving the frowning of a lifetime." But it turns out there's discrepancy between the time being displayed on computers – which comes from the Internet – and the time displayed on the desk phones, which comes from a computer with a pre-Windows XP PC that several times a year has to be manually set to the correct time. "The department head had to request that the IT department send out a memo asking folks to not trust the time on the desk phone," fish says, "but base their punctuality on the time displayed in the system tray of their computers, so everybody would be on time and the early birds wouldn't continue to think that being on time is being late."

Just the Fax

User at a community bank is waiting for a fax containing information related to a loan application, reports a pilot fish on the scene. "These days, most everything in banking is sent encrypted," fish says. "When she received the fax, it was a single page that read: 'This is a secure, encrypted message. Desktop users: Open the attachment (message_name.html) and follow the instructions. Mobile users: Get the mobile application. Need help? Click here.' When she contacted the person who sent it, asking how she was to get to the information, he replied, 'All you need to do is click and open the attachment.' It took my user several minutes to get the guy to understand why she was unable to do that."

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dtSearch dtsearch.com	27
IBM ibm.com/systems/simplifycloud	C2
InterSystems intersystems.com/ideal7a	3
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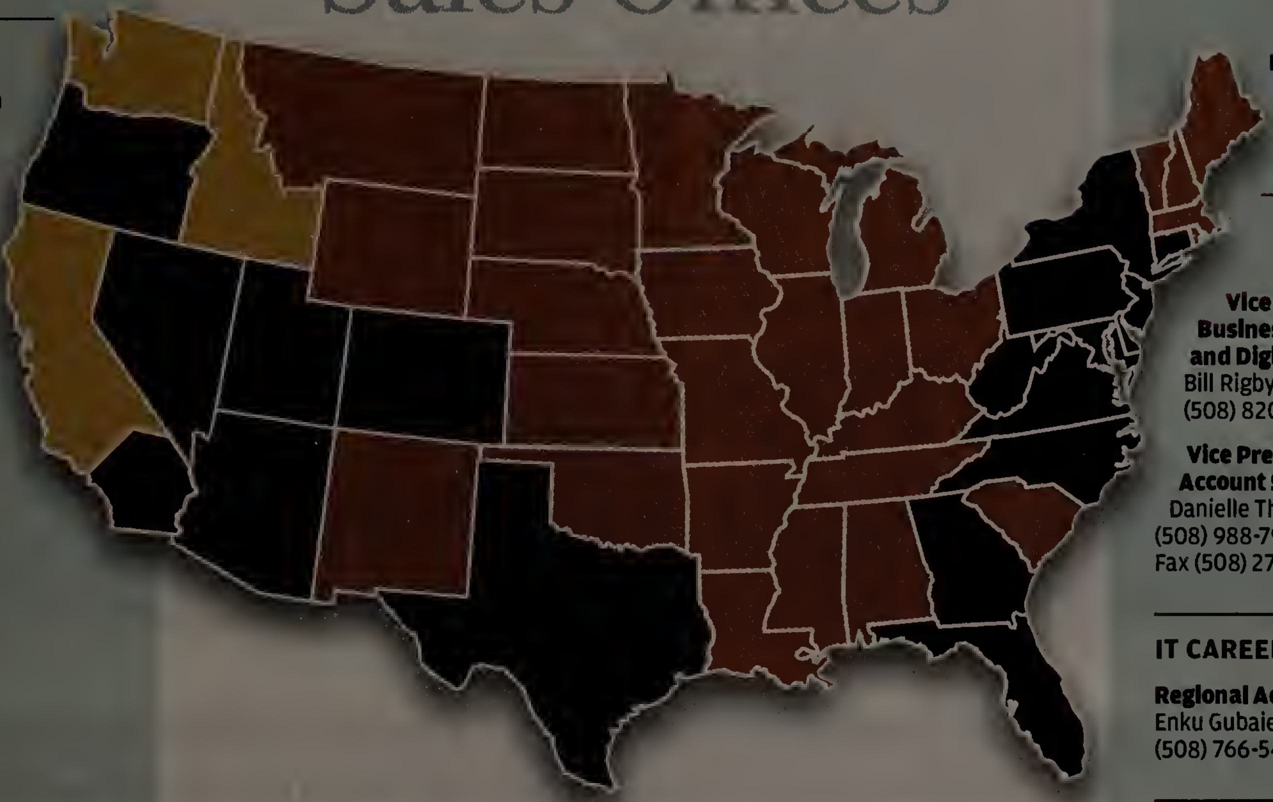

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— **OPINION**

THORNTON A. MAY

The Path to Big Data Mastery

> A 10-step pattern repeats itself in institutions possessing differentiated big data capabilities.

THE THINK-TANKERS on the Executive Leadership Council at AIIM systematically use a four-box matrix to reduce uncertainty, allocate investments and calibrate new product/service initiatives. This simple tool — with "important and difficult" in the upper right and "unimportant and easy" in the lower left — produces surprisingly powerful insights.

During year-end discussions with 40 executives in 20 vertical markets, I discovered that they all now place big data in that upper-right quadrant. Similarly, readers of Booz & Co.'s Strategy+Business blog designated big data the 2013 Strategy of the Year, and the co-directors of Cognizant's Center for the Future of Work, in a masterful white paper, placed big-data-enabled "meaning making" at the pinnacle of strategic endeavor.

That was enough to prompt me to roll up my sleeves and systematically examine, vertical market by vertical market, how organizations are organizing their path to big data mastery.

Over the past few months, I embarked on a study of how North America's 7,100 banks are approaching the big data opportunity. I found that 20% are doing nothing, 25% are preparing to do something, 30% are currently doing something and 25% are achieving mastery.

Recognizing that each bank is unique, with its own capabilities and habits and its own market reality, I nevertheless sought to identify patterns of behavior evidenced by those banks that seemed to have achieved mastery in big data. The following 10-step, high-level pattern repeated itself in institutions possessing differentiated big data capabilities:

- **Step 1:** Decide to do something.
- **Step 2:** Craft a narrative.
- **Step 3:** Access Type 1 smartness.
- **Step 4:** Inventory analytical resources.
- **Step 5:** Assess readiness.
- **Step 6:** Centrally manage analytical resources.
- **Step 7:** Create analytic capability.
- **Step 8:** Obtain the support of senior management.
- **Step 9:** Act on insight.
- **Step 10:** Link to behavior.

Type 1 smartness, by the way, is the sort of intelligence possessed by someone who can do unstructured problem-solving, like a doctor, who can diagnose a situation and propose an appropriate course of action.

While the path-to-mastery pattern is conceptually simple, successfully executing it requires courage, perseverance and patience. Delivering the true value of big data is important and difficult.

The thing they don't tell you is that it takes time. Acquiring the body of knowledge, learning the language, adopting the ideas and making the cultural adjustments required for harnessing full value from big data is a cumulative process. The path to big data mastery took one entertainment conglomerate seven years — three to decide to do something and four to build out the infrastructure. Chris Wegrzyn, director of data architecture for the Democratic National Committee, explained to *The Huffington Post* why the ramp-up to big data mastery took two years for the Obama 2012 campaign: "It's one thing to build up some technology and hire some people. It's another thing entirely to transform how your operation works fundamentally."

How far along are you on the path to big data mastery? ◆

Thornton A. May is author of *The New Know: Innovation Powered by Analytics* and executive director of the IT Leadership Academy at Florida State College in Jacksonville. You can contact him at thorntonamay@aol.com or follow him on Twitter (@deanitla).

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